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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,077	10/30/2001	Ryo Takajitsuko	FUJI 19.117	9877

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EXAMINER	
AHMED, SALMAN	
ART UNIT	**PAPER NUMBER**
2616	

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,077	TAKAJITSUKO ET AL.	
	Examiner	Art Unit	
	Salman Ahmed	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *9/27/2006 (RCE)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-26,28,29 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2,3,5-7,9,10,12-14,16-18,20,21 and 23-25* is/are allowed.

6)☒ Claim(s) *4,8,11,15,19,22,26,28,29 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 2-26, 28-29, and 31 are pending.

Claims 1, 27 and 30 are cancelled by the Applicant.

Claims 2, 3, 5-7, 9,10, 12-14, 16-18, 20, 21 and 23-25 are allowed.

Claims 4, 8, 11, 15, 19, 22, 26, 28, 29 and 31 are rejected.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brezzo et al. (US PAT 6992980, hereinafter Brezzo), in view of Kobayashi et al. (US PAT PUB 2003/0179712), hereinafter referred to as Kobayashi.

Brezzo teaches a communications apparatus (figure 1-c element 5) for switching among different interfaces (figure 1-c, adapters 160) and comprising a switch unit (figure 1-c switch fabric 100), the switch unit comprising: a main switch (figure 1-c switch fabric 100) for switching data of a fixed length (column 3 lines 23-26, Referring to FIG. 1(a), there is shown a conceptual view of a fixed-size packet switch fabric 100 capable of switching a fixed-sized packet 110 (also often referred to as cell)); and an interface having a first buffer (figure 1-c, buffer 194) for an input of the main switch and a second buffer (figure 1-c, egress buffer 164) for an output of the main switch;

Brezzo does not explicitly teach the switch unit being multiplexed; and a working system receiving a backpressure control request from a passive system discards that backpressure control request.

Kobayashi in the same field of endeavor teaches switch unit (figure 64) being multiplexed and (page 51 section 2203) the communications data from the BSGCSH to the DS3-SMDS interface is transmitted to the ASSWSHs of both active and standby systems, and the DS3-SMDS interface selects only the communications data transmitted through the ASSWSH of the active system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo's system/method by incorporating a multiplex switching unit having capability of discarding cells received from passive unit as taught

by Kobayashi. The motivation is that it efficient to implement redundant systems for reliability and therefore discarding messages (as taught by Kobayashi, page 51 section 2203) from the redundant standby or passive systems.

4. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brezzo et al. (US PAT 6992980, hereinafter Brezzo), in view of Dell et al. (US PAT PUB 2002/0085578), hereinafter referred to as Dell.

Brezzo teaches a communication control method for switching among different interfaces (figure 1-c, adapters 160) comprising the step of: switching data handled by different interfaces after once buffering data of a fixed length (column 3 lines 23-26, Referring to FIG. 1(a), there is shown a conceptual view of a fixed-size packet switch fabric 100 capable of switching a fixed-sized packet 110 (also often referred to as cell)) related to the data handled by the different interfaces (column 6 lines 31-38, The switch traffic must hold what it has already received, in the switch fabric itself, for that port (if the switch has provisions to do so). More importantly, it broadcasts 184 to all IN legs of port adapters, such as 191, the information that it cannot accept traffic for that particular output 174. This information is then used by all the adapters (actually, by all adapters receiving traffic for that particular port) to hold it in their internal buffering); sending the switched data to the circuits a after once buffering the switched data (column 3 lines 53-55, The sub-port adapter keeps or resumes forwarding traffic, if any is received, destined for this Nth sub-port OUT leg as soon as it is reported to be not congested).

Brezzo does not explicitly teach sending the backpressure control request to another apparatus by passing switching of the backpressure control request when the buffering assumes a predetermined state prior to switching.

Dell in the same field of endeavor teaches sending the back pressure control request to another apparatus by passing switching of the back pressure control request when the buffering assumes a predetermined state prior to switching (figure 27 a and b and page 14 section 0198-0202).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo's system/method by incorporating the steps of sending the back pressure control request to another apparatus by passing switching of the back pressure control request when the buffering assumes a predetermined state prior to switching. The motivation is that sending backflow message by bypassing switch will save time and resources; thus enabling an efficient switching system.

5. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezzo et al. (US PAT 6992980, hereinafter Brezzo), in view of Araya et al. (US PAT PUB 2002/0154648), hereinafter referred to as Araya and in view of Dell.

In regards to claim 28 Brezzo teaches a communication apparatus for switching among different interfaces (figure 1-c, adapters 160) comprising the step of: switching data handled by different interfaces after once buffering data of a fixed length (column 3 lines 23-26, Referring to FIG. 1(a), there is shown a conceptual view of a fixed-size packet switch fabric 100 capable of switching a fixed-sized packet 110 (also often

referred to as cell)) related to the data handled by the different interfaces (column 6 lines 31-38, The switch traffic must hold what it has already received, in the switch fabric itself, for that port (if the switch has provisions to do so). More importantly, it broadcasts 184 to all IN legs of port adapters, such as 191, the information that it cannot accept traffic for that particular output 174. This information is then used by all the adapters (actually, by all adapters receiving traffic for that particular port) to hold it in their internal buffering); sending the switched data to the circuits a after once buffering the switched data (column 3 lines 53-55, The sub-port adapter keeps or resumes forwarding traffic, if any is received, destined for this Nth sub-port OUT leg as soon as it is reported to be not congested).

Brezzo does not explicitly teach a plurality of processors connected to the switch unit for performing processes according to a predetermined protocol; and a bus for transmitting a predetermined back pressure control signal to the plurality of processors.

Araya in the same field of endeavor teaches a plurality of processors connected to the switch unit for performing processes according to a predetermined protocol (page 3 section 0025, the router comprises one or more network processing (NP) devices for routing data packets from a source NP device to a destination device via a switch fabric, with each network processing device supporting a number of interface ports, each port capable of interfacing with one or more data queues for receiving packets associated with a class-of-service characterizing the forwarding treatment of the packets); and a

bus for transmitting a signal to the plurality of processors (figure 2 , connection between switch and four NP blades 12a-12d).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo's system/method by incorporating a plurality of processors connected to the switch unit for performing processes according to a predetermined protocol; and a bus for transmitting signal to the plurality of processors. The motivation is that (page 1 section 0009-0013, as suggested by Araya) A network processor (herein also mentioned as an "NP") has been defined as a programmable communications integrated circuit capable of performing one or more of the following functions: Packet classification--identifying a packet based on known characteristics, such as address or protocol; Packet modification--modifying the packet to comply with IP, ATM, or other protocols (for example, updating the time-to-live field in the header for IP); Queue/policy management--reflects the design strategy for packet queuing, de-queuing, and scheduling of packets for specific applications; and, Packet forwarding--transmission and receipt of data over the switch fabric and forwarding or routing the packet to the appropriate address. Thus, due to its robust capability, network processors are widely used in a switching system for reliable and efficient communication.

In regards to claim 28 Brezzo and Araya teaching transporting data frames and control frames via the bus (page 1 section 0016).

Brezzo and Araya does not explicitly teach transmitting a predetermined back pressure control signal to the plurality of processors using the bus.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo and Araya's system/method by transmitting a predetermined back pressure control signal to the plurality of processors using the bus as back pressure or flow control messages are special kind of control messages that are used to prevent congestion and packet loss; thus creating a reliable switching system.

In regards to claim 28 Brezzo and Araya does not explicitly teach a plurality of switch units.

Dell in the same field of endeavor teaches plurality of switch units (figure 2 and figure 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo and Araya's system/method by using plurality of switch units as taught by Dell. The motivation is that (as suggested by Dell, page 3 section 46, Input, crossbar, and output devices can be configured together in different ways using different numbers of the different types of devices to achieve a wide range of switch fabric architectures having a wide range of switch capacities) multiple switching unit can be used for redundancy as well as alternative paths; thus enabling efficient and reliable communication.

In regards to claim 29, Brezzo, Araya and dell teach switch unit receives a back pressure control signal and controls a flow of information form the first buffer (column 4 lines 35-47, in each sub-port adapter, when a congestion is detected in aan OUT leg, it is reported through the corresponding IN leg. The detected congestion is piggybacked

over the incoming traffic entering the input port of the N-port core switching fabric and coming from the IN leg sub-port adapter).

Araya and dell does not explicitly teach having plurality of switch units.

Dell in the same field of endeavor teaches plurality of switch units (figure 2 and figure 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo and Araya's system/method by using plurality of switch units as taught by Dell. The motivation is that (as suggested by Dell, page 3 section 46, Input, crossbar, and output devices can be configured together in different ways using different numbers of the different types of devices to achieve a wide range of switch fabric architectures having a wide range of switch capacities) multiple switching unit can be used for redundancy as well as alternative paths; thus enabling efficient and reliable communication.

6. Claims 4, 8, 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezzo, in view Kuo et al. (US PAT PUB 2003/0021230, hereinafter Kuo).

In regards to claims 4, 15 and 22 Brezzo teaches a communication apparatus for switching among different interfaces (figure 1-c, adapters 160) comprising the step of: switching data handled by different interfaces after once buffering data of a fixed length (column 3 lines 23-26, Referring to FIG. 1(a), there is shown a conceptual view of a fixed-size packet switch fabric 100 capable of switching a fixed-sized packet 110 (also

often referred to as cell)) related to the data handled by the different interfaces (column 6 lines 31-38, The switch traffic must hold what it has already received, in the switch fabric itself, for that port (if the switch has provisions to do so). More importantly, it broadcasts 184 to all IN legs of port adapters, such as 191, the information that it cannot accept traffic for that particular output 174. This information is then used by all the adapters (actually, by all adapters receiving traffic for that particular port) to hold it in their internal buffering); sending the switched data to the circuits a after once buffering the switched data (column 3 lines 53-55, The sub-port adapter keeps or resumes forwarding traffic, if any is received, destined for this Nth sub-port OUT leg as soon as it is reported to be not congested).

Brezzo does not explicitly teach a processor performs backpressure control on the first buffer when the second buffer assumes a predetermined state.

Kuo in the same field of endeavor teaches a processor (Figure 1, scheduler and flow control manager, page 2 section 0028, The switch system also includes a transmit-side traffic manager 108 and a receive-side traffic manager 110. In one embodiment, the traffic managers 108 and 110 are network processors) performs back pressure control on the first buffer when the second buffer assumes a predetermined state (page 2 section 0032, The scheduler 114 operates to accept or deny the one or more requests that are being made by the VQM 104 for passing data through the switch 112 to the VQM 106. The scheduler 114 arbitrates amongst a plurality of incoming requests associated with the various ports and decides which one or more of the requests to grant.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo's system/method by incorporating a processors/scheduler back pressure control on the first buffer when the second buffer assumes a predetermined state as taught by Kuo. The motivation is that a processor is a a programmable communications integrated circuit capable of performing one or more of the following functions: Packet classification--identifying a packet based on known characteristics, such as address or protocol; Packet modification--modifying the packet to comply with IP, ATM, or other protocols (for example, updating the time-to-live field in the header for IP); Queue/policy management--reflects the design strategy for packet queuing, de-queuing, and scheduling of packets for specific applications; and, Packet forwarding--transmission and receipt of data over the switch fabric and forwarding or routing the packet to the appropriate address. Thus, due to its robust capability, processors are widely used in a switching system for reliable and efficient communication including flow control.

In regards to claim 8, Brezzo teaches the back pressure control request is formed by a predetermined flow control cell (figure 4).

7. Claims 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brezzo and Kuo as applied to claim 4 above and further in view Dell.

Brezzo and Kuo describe a backflow system as described in the rejections of claim 4 above.

Brezzo and Kuo do not explcilty teach the backpressure control being performed by predetermined Quality of Service (QoS) class units.

Dell in the same field of endeavor teaches back pressure control is performed by predetermined Quality of Service (QoS) class units (page 13 section 0192, Back-pressure is used for end-to-end flow control among switching elements and the traffic management line cards to maximize the usage of buffer memory. Preferred embodiments of the present invention rely on an efficient back-pressure (BP) and fast flow control scheme to achieve a highly scalable, lossless switch fabric architecture. Further, to support QoS classes, embodiments of the present invention regulate and control the allocation of the bandwidth across the switch fabric to different flows. Back-pressure is preferably applied selectively only to the traffic destined to congested ports. Furthermore, the switch fabric preferably allows selective back-pressure to be asserted on any traffic bound for an output device that has reached its buffer allocation limit).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Brezzo and Kuo's system/method by incorporating the steps of back pressure control being performed by predetermined Quality of Service (QoS) class units as taught by Dell. The motivation is that Qos in conjunction with back flow control enables a robust and reliable data flow through a switching unit; thus creating an efficient communication system.

Allowable Subject Matter

8. Claims 2, 3, 5-7, 9,10, 12-14, 16-18, 20, 21 and 23-25 are allowed.

9. The following is an examiner's statement of reasons for allowance:

The prior arts of record do not teach the following:

In regards to claim 2 the prior arts do not teach a processor that is connected to the switch unit and processes data according to a predetermined protocol, the processor having a third buffer and a fourth buffer connected to the first buffer and the second buffer the processor performing back pressure control on the third buffer when the first buffer assumes a predetermined state.

In regards to claim 3 the prior arts do not teach a processor that is connected to the switch unit and processes data according to a predetermined protocol, the processor having a third buffer and a fourth buffer connected to the first buffer and the second buffer the processor performing back pressure control on the first buffer when the fourth buffer assumes a predetermined state.

In regards to claim 5 the prior arts do not teach a processor that is connected to the switch unit and processes data according to a predetermined protocol, the processor having a third buffer and a fourth buffer connected to the first buffer and the second buffer the processor performing back pressure control from an apparatus that is connected to the processor.

The prior arts alone or in combination fail to jointly suggest or teach the claimed combination of features as taught by the instant application. Therefore claims 2, 3, 5-7, 9,10, 12-14, 16-18, 20, 21 and 23-25 are to be deemed allowable over prior art.

Response to Arguments

10. Applicant's arguments, see pages 9-13 of the Remarks section, filed 8/29/2006, with respect to the rejections of claims have been fully considered. In view of the new ground of rejections, further response to the arguments is moot.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Salman Ahmed whose telephone number is (571)272-8307. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit 2616

SA
10/18/2006

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